C·R·E·S

Center For Reproduction Of Endangered Species

1989/90 Winter Report

Editor: Judy Kinsell

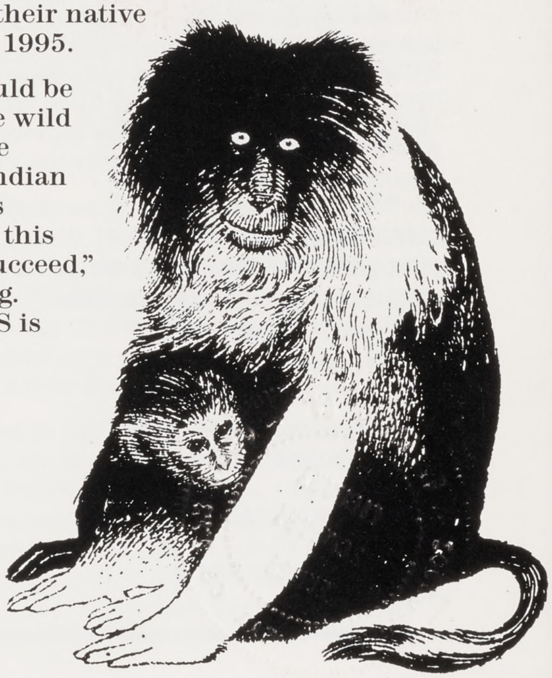
• BEHAVIOR A group of 11 lion-tailed macaques living in an off-exhibit breeding corral at the Wild Animal Park may become the first colony of their species to be reintroduced into the wild. Under the direction of CRES behaviorist Dr. Donald Lindburg, observers are monitoring the monkeys carefully to make sure they have the skills they will need in the wild.

Over the past six months, the macaques have responded exceptionally well to their naturalistic ¾-acre corral. Says Dr. Lindburg, "They appear to be blissfully happy, more relaxed and with no signs of intestinal problems which are chronic on cement." At this writing, all of the mature females are pregnant, and four babies are expected toward the beginning of 1990.

Dr. Lindburg is interested in the socialization of the colony as a whole and in the adjustment of the male in particular. "The male was born in the Zoo's monkey yard in 1975. He had never been on a natural surface, never seen predators, and yet his behaviors are very natural. In one instance, a raptor circled down close to the corral. The male began to give the typical alarm call of the species. One little juvenile became so frightened that she lay flat on the ground, petrified. The bird circled lower until the mother frantically ran over to the juvenile, grabbed her and struggled to pull her to safety. Meanwhile, the male was leaping up, trying to grab the raptor by the feet. The macaques experienced a natural predation threat and handled it beautifully."

According to Dr. Lindburg, the macaques may be reintroduced to their native India as early as 1995.

The animals would be monitored in the wild in a collaborative effort with the Indian authorities. "It is important to try this to see if it will succeed," says Dr. Lindburg. "Of anyone, CRES is best positioned to do this."



A SHARED CONCERN

Conservationists and wildlife advocates nationally and internationally share the concern of CRES scientists for the plight of wild animals today. Several major zoos are also supporting in-house research and managed breeding programs. Most, in accordance with the American Association of Zoological Parks and Aquariums' "Species Survival Program" are increasing their emphasis upon inter-zoo collaboration and breeding exchange.

As a leader in this effort, CRES has established an ongoing network which includes zoos, major universities, and wildlife centers. Cooperative projects with more than a hundred organizations expand our efforts against wildlife extinction. Following is a partial list of our collaborative partners:

- AUDUBON PARK AND ZOOLOGICAL GARDEN, LA
- AUSTRALIAN KOALA FOUNDATION, AUSTRALIA
- BELIZE ZOO
- BIRMINGHAM ZOO, AL
- BUFFALO ZOOLOGICAL GARDENS, NY
- BUSCH GARDENS, FL
- CALGARY ZOO, CANADA
- CALIFORNIA INSTITUTE OF TECHNOLOGY
- CALIFORNIA POLYTECHNIC INSTITUTE–POMONA
- CALIFORNIA STATE UNIVERSITY–IRVINE
- CANYON COLORADO EQUID SANCTUARY
- CHEYENNE MOUNTAIN ZOOLOGICAL PARK, CO
- CHICAGO ZOOLOGICAL PARK (BROOKFIELD ZOO), IL
- CINCINNATI ZOO & BOTANICAL GARDEN, OH
- COLORADO STATE UNIVERSITY
- COLUMBUS ZOOLOGICAL GARDENS, OH
- CORNELL UNIVERSITY
- DALLAS ZOO, TX
- DENVER ZOOLOGICAL GARDENS, CO
- DEPARTMENT OF WILDLIFE CONSERVATION AND AGRICULTURE, WINDHOEK, NAMIBIA
- DEPARTMENT OF WILDLIFE AND TOURISM, REPUBLIC OF KENYA
- DETROIT ZOOLOGICAL PARK, MI
- DUKE UNIVERSITY PRIMATE CENTER
- ETOSHA ECOLOGY INSTITUTE, NAMIBIA
- FOSSIL RIM FOUNDATION, TX
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- MURRIETA EQUINE ASSOCIATES
- NATIONAL MARINE FISHERIES SERVICE
- NATIONAL MUSEUMS OF KENYA
- NATIONAL UNIVERSITY OF COSTA RICA
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- SENECA PARK ZOO, NY
- SUNSET ZOOLOGICAL PARK, KS
- TEXAS A&M UNIVERSITY
- TEXAS TECHNICAL STATE UNIVERSITY
- TOLEDO ZOOLOGICAL GARDEN, OH
- TOPEKA ZOOLOGICAL PARK, KS
- USDA, ANIMAL AND PLANT HEALTH INSPECTION SERVICE
- USDA, NATIONAL ANIMAL DISEASE CENTER
- U.S. FISH AND WILDLIFE SERVICE
- UNIVERSITY OF ARIZONA
- UNIVERSITY OF CALIFORNIA–BERKELEY
- UNIVERSITY OF CALIFORNIA–DAVIS
- UNIVERSITY OF CALIFORNIA–IRVINE
- UNIVERSITY OF CALIFORNIA–SAN DIEGO
- UNIVERSITY OF GEORGIA
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For information on how you can help CRES, please call Amy Parrott at (619) 231-1515, extension 4249.

• INFECTIOUS DISEASES

Scientists have discovered through genetic analysis that all African cheetahs appear to be more closely related than individuals of other animal species from wild populations. They suspect that in the Pleistocene era a population bottleneck forced extensive inbreeding. This limited gene pool, shared by a wild population of less than 20,000 cheetahs, may have resulted in low reproductive potential and a particularly high susceptibility to disease.

One of these diseases, feline herpesvirus, affects both domestic and exotic cats, and can be especially severe in cheetahs. At CRES, immunologists Drs. Michele Miller-Edge and Michael Worley are working to understand the cheetahs' immune system and how it responds to this and other potentially serious viral diseases.

When cheetahs are immobilized for any reason at the San Diego Wild Animal Park or at many other zoos, a blood sample is taken and sent to the CRES virology lab. There, scientists check the function of the white blood cells, which is a measure of the animal's ability to fight off disease. They set up cells in a tissue culture and stimulate them with the virus in an attempt to model what would happen if the animal itself were infected with feline herpesvirus.

"We look at cell division as a measure of response to the simulated infection," explains Dr. Miller-Edge. "If an animal gets infected, the white blood cells should divide so they can increase their numbers to fight the virus." Several pilot studies have been conducted thus far at CRES, using substances such as Interleukin-2 in the cultures to boost the cells' response. "Once we decipher the mechanisms that are responsible for producing a good immune response," concludes Dr. Miller-Edge, "we will be able to improve current vaccines which will better protect cheetahs not only in our own collection, but at other zoos as well."

• ENDOCRINOLOGY

A gift of Sichuan takins from the Chinese government to the San Diego Zoo is giving CRES scientists a rare opportunity to study a species about which very little is known. Last year, both adult females delivered healthy male calves—the first Sichuan takins to be born outside of China. Still, the exact gestation and other biological data remains undiscovered.

At CRES, endocrine specialist Nancy Czekala-Gruber is charting estrogen and progesterone levels from fecal samples to detect future pregnancies, and to learn more about the hormone cycles of female takins BK1 and BK2. Keeper Steve Castille obtains daily samples, and volunteer observers monitor the interaction between the male and both females since the births of the calves in June and July.

Ms. Czekala-Gruber explains the findings of the hormone analysis thus far. "About 90 days after parturition, in the fall of 1989, obvious mating occurred between the adult male and BK1. Subsequently, her progesterone levels rose dramatically and remained elevated, indicating to us that she is indeed pregnant again. BK2 also mated approximately 90 days after the birth of her calf. Fecal progesterone levels increased but became erratic and fell back to baseline about 40 days later. Subsequently there was mating again. We don't know if BK2 was pregnant and miscarried, or if she was just experiencing a normal cycle. That should become clear as the study continues."

In hormone analysis each species must be approached separately. Hormone techniques which are effective for one species often prove to be inadequate for another. In this study, data from studies on musk oxen—a species which may be related to the takin—was used as a general guideline in the development of a new fecal technique.

This investigation is just one example of how CRES endocrinologists contribute to the care and management of endangered species. Says Ms. Czekala-Gruber, "We keep creating new techniques and working with new species. We do a lot of work in service to other zoos which can be challenging in terms of volume, but wonderful because it helps their breeding efforts."

• GENETICS

Grants from The Pew Charitable Trusts and the John and Beverly Stauffer Foundation are enabling CRES geneticist Dr. Oliver Ryder to train scientists in Czechoslovakia and Kenya on DNA analysis techniques. On a recent trip to the Vychodoceska Zoo at Dvur Kralove, Czechoslovakia, Dr. Ryder spearheaded a project to explore the gene pool of plains zebras.

The zoo at Dvur Kralove is ideal for the study because of their extensive zebra collection and meticulous records. In the late 1960s and early 1970s, the Czechoslovakians made seven expeditions to Africa, recording the exact capture places of their animals. There are many varieties of plains zebras, currently differentiated by stripe patterns and by exact geographic origin. Yet no one knows how genetically distinct they are.

Dr. Ryder's DNA analysis will be the first to determine the degree of relatedness of several regional forms of zebras, including maneless, Chapman's, Damara, Grant's and, as a basis of comparison, Hartmann's mountain zebra. The samples will be analyzed at CRES, then the techniques will be taught and results shared with scientists from Dvur Kralove. Says Dr. Ryder, "The techniques we will use are the most powerful ones available to the research community at this time. In the genetics group at CRES, we have years of experience in working with the genetics of equids, so we are uniquely qualified to do this kind of study. It will be the most definitive study of its type."

Rather than answer a specific conservation question, the investigation will address the fundamental question of how to learn about the genetic structure of animal populations. Knowing how animals from different geographic regions differ genetically will be of interest to all zoos.

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